



# MINUTES

## Stray Electric Current and Agriculture Study Committee

October 28, 2013

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### MEMBERS PRESENT:

Senator Thomas Courtney, Co-Chairperson  
Senator Bill Anderson  
Senator Wally Horn  
Senator Charles Schneider  
Senator Rich Taylor

Representative Peter Cownie, Co-Chairperson  
Representative Nancy Dunkel  
Representative Pat Grassley  
Representative Bob Kressig  
Representative Steven Olson

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## MEETING IN BRIEF

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- I. Procedural Business
- II. Stray Voltage Overview
- III. Stray Voltage — Iowa Perspective
- IV. Iowa Utilities Board
- V. Iowa Farm Bureau Federation
- VI. Iowa State Dairy Association
- VII. Iowa Association for Justice
- VIII. Stray Voltage Standards
- IX. Economic Development Impact
- X. Stray Voltage Litigation — Costs and Implications
- XI. Stray Voltage Testing and Detection
- XII. Dairy Farmer Perspective
- XIII. Stray Voltage Research and Legislative Parameters
- XIV. Committee Discussion
- XV. Materials Filed with the Legislative Services Agency



## **Stray Electric Current and Agriculture Study Committee**

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### **I. Procedural Business**

**Call to Order.** The Stray Electric Current and Agriculture Study Committee was called to order at 10:00 a.m. on October 28, 2013, in Room 103 of the State Capitol Building.

**Adjournment.** Upon conclusion of the presentations and discussion by the committee, the meeting was adjourned at 2:26 p.m.

### **II. Stray Voltage Overview**

Dr. Douglas J. Reinemann, Ph.D., Professor and Chair, Biological Systems Engineering, University of Wisconsin-Madison, provided information regarding empirical research conducted on stray voltage (SV) since the early 1960s. According to Dr. Reinemann, the causes and cures for SV are well understood, as are the effects of electrical exposure to farm animals. In general, the source of SV is voltage developed by current flowing on the resistance of the grounded-neutral system of a farm operation. SV always involves voltage coming from the electric utility and the farm, so it is important to isolate the source. Cattle watering devices are one of the most common sources for SV. The effects of SV depend on the voltage level, the body pathway, and the individual animal's sensitivity. SV behavioral effects range from mild physical sensations, to involuntary muscle contractions, to intense behavioral reactions.

Dr. Reinemann stated that developing a reasonable level of SV is one goal of research, because completely eliminating it is impossible, expensive, potentially dangerous, and not warranted by the research results. SV becomes damaging when it occurs at a high enough level to be aversive to the cow, when it affects eating and drinking behavior, and when it occurs frequently. Several SV studies were mentioned and discussed, including the first published cow study in 1962 in New Zealand, which concluded that three volts was the likely minimum level required to produce a response in a cow. Another study concluded adverse behavioral responses first occur in cows in the two-to-four volt range. Since then, research findings have generally remained consistent within this range. Studies have also determined that apart from behavioral reactions, SV can affect an animal's milk production, somatic cell count, reproduction, and stress hormones, and can create milking problems. The studies measured the conditions necessary to produce these effects and the voltage, current, and exposure levels at which they become problematic.

Dr. Reinemann went on to discuss additional findings of the studies. It has been found that the milking process is a highly unlikely location for SV problems because, among other things, the equipment has a very high resistance and is usually well bonded. It has also been found that there is no credible evidence to verify the claim that currents in earth and other electric or magnetic fields contribute to poor health and milk production in dairy herds. Finally, the studies conclude that electric testing is the only way to determine if SV is a cause of behavioral problems, and that animal behavior or other symptoms can all be produced by other causes and are not determinative. Continued SV research, as well as faithfulness to the existing research, are important because there exists a number of unorthodox approaches to addressing SV that are not based on sound scientific principles and have not stood the test of time. These approaches have produced a great deal of mistrust in the agricultural community and can often unnecessarily pit farmers and electric suppliers against each other. The committee inquired about the effectiveness



of the SV standards adopted by Wisconsin. Dr. Reinemann responded that he believes the standards do work. Wisconsin standards go to great lengths to determine the source of SV and have clear procedures to measure voltage. He believes these have provided the most value to the state.

### **III. Stray Voltage — Iowa Perspective**

Dr. Patrick Gorden, DVM, Director, Food Supply Veterinary Medicine, Veterinary Diagnostic and Production Animal Medicine, Iowa State University, and Dr. Leo Timms, Ph.D., Extension Dairy Specialist and Associate Professor of Animal Sciences, Iowa State University, provided an Iowa perspective on SV. Both frequently investigate milk production, milk quality, cow health, and behavioral issues on farms. It was noted that SV research began in earnest in the 1960s, increased during the 1970s and 1980s, and resulted in a United States Department of Agriculture meeting in 1993 which addressed testing and training procedures. Dr. Timms estimated that he performs 50-100 field investigations per year. The speakers briefly explained their investigation process to the committee, but stressed that no two investigations are the same. An investigation usually begins with contact from a farmer after some suspicious cattle behavior is noticed. Most farmers do not believe their issue is SV related and suspect another problem. An attempt is made to rule out SV early, and then other potential causes of the cow's behavioral problems are addressed. It was noted that SV is identified as the ultimate cause of a problem in relatively few investigations. If SV cannot be eliminated as a potential cause, farmers are advised to work with their utility company and other professionals to investigate and test for SV. The speakers differed on their personal approach to SV testing; Dr. Gordon stated that he carries appropriate equipment and will take measurements before contacting the utility when he suspects SV, while Dr. Timms chooses not to take measurements himself and will contact the utility provider. SV can arise very suddenly due to lightning strikes, wiring becoming loose, or other causes.

The committee inquired about whether SV affects an entire herd, and whether breed, size, or age of a cow matters. The speakers stated that they have no data to support the claim that different breeds, sizes, or ages are affected differently, but noted that dairy cows are affected more often than other animals simply because there is more electrical equipment involved in the dairy process. They opined that if SV is bad enough it can affect an entire herd, for example, if there is aversion to the point where cows avoid drinking water.

### **IV. Iowa Utilities Board**

Ms. Libby Jacobs, Board Chair, Iowa Utilities Board (IUB), explained IUB's position and involvement with regard to SV. Ms. Jacobs stated that IUB is neutral on the issue and that its involvement with SV is very limited, having received only one formal complaint dating back to 2005. Ms. Jacobs next briefly outlined IUB's complaint resolution process, which starts with the filing of a formal complaint. Next, the parties are contacted and the IUB starts an investigation, during which engineers and other third-party contractors may become involved. Following the investigation IUB will issue an order and may recommend appropriate remediation. Ms. Jacobs summarized the 2005 formal complaint and described its outcome as satisfactory to the parties involved. The IUB was guided by the Wisconsin SV standards in resolving that complaint and looks to those standards as one potential model to consider in crafting legislation.



## **Stray Electric Current and Agriculture Study Committee**

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Ms. Jacobs additionally outlined features IUB would like to see in any future SV legislation that may be passed by the General Assembly. First, care should be taken to ensure the law is technically correct. Second, with regard to proposed legislation introduced during the 2013 session (Senate File 270), flexibility should be afforded IUB in its preparation of “determination of source” documents because such preparation is both an art and a science. Third, care should be taken to ensure that biosecurity protocols are followed to maintain the safety of both the farmers and IUB’s employees and contractors. Fourth, IUB should be allowed to establish rules for the measurement of SV, which would give IUB valuable flexibility. Fifth, IUB should be appropriated additional funding to administer the legislation. IUB estimates it would need, at a minimum, an additional 0.5 full-time equivalent position and funding to hire third-party contractors. Administrative duties of internal counsel and other IUB employees may also produce additional costs to the IUB. Ms. Jacobs commented that she thought Senate File 270 fit well within the core mission of IUB. Finally, the committee asked Ms. Jacobs to rate how much of a problem SV was in Iowa. She maintained that, based on the single formal complaint IUB has received, it would have to be regarded as a relatively low-level problem.

### **V. Iowa Farm Bureau Federation**

Mr. Marty Schwager and Mr. Matt Steinfeldt, State Policy Advisors for the Iowa Farm Bureau Federation (IFBF), outlined IFBF’s position on the issue of SV. Mr. Steinfeldt began by explaining that there are roughly 1,800 dairy farms in Iowa, and he believes they have a good working relationship with the rural electric cooperatives (REC). To build on those relationships, IFBF advocates for a cooperative voluntary approach instead of the adoption of statutory or regulatory SV standards. When standards are placed in code or administrative rule they create a precedent that can be difficult for farmers to overcome. Moreover, codified standards would be arbitrary, inflexible, and would have a disparate impact on dairy farms because each one is unique and affected differently by SV. Finally, there is no evidence to suggest that frivolous SV lawsuits are being pursued by farmers. The solution to addressing SV concerns is to have both the farmer and utility cooperate with experts to identify and fix the problem.

IFBF’s envisioned cooperative program would be voluntary. It would include a training component that trains electricians, utilities, farmers, and other agricultural professionals to avoid, identify, and fix SV problems. The program would also develop noncodified standardized procedures for testing for SV and making recommendations for SV remediation, such as the installation of isolators at the expense of the utilities. An isolator is a device that isolates or blocks stray current coming from a utility before it affects a farm. Additional funding may be necessary to pay for the assistance of outside experts in developing the protocols and educational materials.

Mr. Schwager discussed Vermont’s voluntary SV program put into place in 1994, which requires that isolators be installed by utilities when SV exceeds 0.5 volts, and requires utilities to establish their own testing procedures. Since 1995, over 2,000 isolators have been installed on Vermont farms through the voluntary program. Although IFBF is not advocating for Iowa’s adoption of the Vermont SV program, it believes the program to be a good illustration of viable alternatives that exist to the codification of SV standards.



The committee inquired about IBBF's position on the Wisconsin SV standards. Mr. Steinfeldt responded that IBBF is not necessarily against the standards in principle, but it is against the codification of those standards, as was done in Wisconsin. Codification of SV standards would make it difficult for a farmer to overcome their persuasiveness, even if damage occurred at a level below the threshold amount set out in law. The committee next inquired as to how a voluntary program would result in SV standards. Mr. Schwager responded that the key is getting the stakeholders to cooperate and participate. A committee member expressed skepticism that such cooperation would occur in the future if it had not already, and asked how it could be accomplished. Mr. Schwager responded that, in Vermont for example, the state's department of agriculture oversaw the program and acted as an intermediary between the parties.

### **VI. Iowa State Dairy Association**

Ms. Jessica Bloomberg, Industry Relations Manager, Iowa State Dairy Association (ISDA), accompanied by three ISDA board members, outlined ISDA's position on the issue of SV. ISDA has roughly 200 dairy producer members in the state. ISDA indicated agreement with the remarks made by IBBF and stated that it believes the issue of SV does not belong in the Legislature. The majority of SV issues are satisfactorily resolved between the dairy farmer and the utility without the need for judicial intervention. In fact, there are only two pending SV cases in Iowa courts, which, ISDA contends, indicates that it is not an issue that requires legislative action.

Mr. Larry Shover, a dairy farmer and one of the board members in attendance, commented that he has a good relationship with his REC and has worked effectively with it to resolve problems. He emphasized the importance of effective testing procedures and education and training regarding SV awareness.

### **VII. Iowa Association for Justice**

Ms. Lisa Davis-Cook, Director of Government Affairs, Iowa Association for Justice (IAJ), and Mr. Bill Wimmer, Wasker, Dorr, Wimmer & Marcouiller, P.C., Des Moines, Iowa, presented IAJ's position on the issue of SV. Ms. Davis-Cook began by reiterating the opposition of previous presenters to specifying SV standards in statute or rule, and added that very few of IAJ's members are currently dealing with this issue and very few cases involving SV have been litigated. Mr. Wimmer acknowledged that a wide variety of different standards exist in many facets of business, but not all necessarily constitute an absolute defense barring a claim for damages. By establishing SV standards in statute or rule, he maintained that such an absolute defense would be created. That would be problematic because SV can impact dairy cows to varying extents at varying levels which could fall below the specified standard. IAJ does support portions of Senate File 270 that would facilitate entry by a utility onto a dairy farm under specified circumstances and would require adherence to biosecurity protocols.

### **VIII. Stray Voltage Standards**

Mr. Stuart Mondschein, Wheeler, Van Sickle, & Anderson, S.C., Madison, Wisconsin, who has represented RECs and utilities in SV litigation in both Wisconsin and Iowa, offered his perspective. He disagreed with the view that SV standards would create an absolute defense. He stated that Wisconsin courts have held the existence of an SV standard does not bar a legal claim, and that



## **Stray Electric Current and Agriculture Study Committee**

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lawsuits have continued to occur in Wisconsin since the standards were established. He estimated that there is less SV litigation in Wisconsin than existed before the adoption of SV standards, and expressed the opinion that standards actually facilitate cooperation between the respective parties involved in an SV dispute by providing well-defined procedures and protocols. The key elements to an SV standard are the establishment of a cow contact point measurement level and the establishment of science-based procedures for measuring that level. He noted that Idaho actually created a process to test and certify professionals who measure SV. Mr. Mondschein finished by briefly summarizing how the Wisconsin standards were created and the outcome of the Iowa SV cases he litigated.

### **IX. Economic Development Impact**

Mr. Kirk Trede, Chief Executive Officer, Eastern Iowa Light and Power Cooperative, briefly explained how dairy production affects economic development in Iowa. He noted that each Iowa dairy cow provides \$23,445 of value to the state. Iowa RECs recognize the economic value of Iowa's dairy industry and are working to further the development of that industry. He expressed the viewpoint that SV standards lead to an improved level of certainty and understanding, and noted that states with the fastest growing dairy production industries (Idaho, Wisconsin, and Michigan) have developed SV standards in some form.

### **X. Stray Voltage Litigation — Costs and Implications**

Mr. Bob Swindell, General Manager and Chief Executive Officer, Access Energy Cooperative, related his REC's experience with a six-year long SV litigation process that involved a substantial expenditure of time, energy, and money on the part of the REC and its members. The REC was first approached by a dairy consultant on behalf of a farmer about an alleged SV problem. Testing was conducted by the parties, with the highest level of SV being recorded at 30 millivolts. In an effort to remediate the SV, the REC first installed an isolator, subsequently relocated and altered the farmer's service, and eventually altered the service to a neighbor's farm. None of these measures were satisfactory to the farmer. Finally, the REC was asked to reconfigure its entire service, which they declined to do because Mr. Swindell believed it would have jeopardized the safety and level of service to other REC members. At the conclusion of the litigation, the REC was found negligent but the farmer was awarded no damages. Mr. Swindell stated that standards would have assisted not only the REC but also the dairy farmer involved, given his observation that the farmer was receiving misleading and ineffective information regarding SV mitigation strategies.

### **XI. Stray Voltage Testing and Detection**

Mr. Tony Harvey, Senior Agriculture Representative, Alliant Energy, discussed SV testing and detection procedures he employs in conducting approximately 20-30 new investigations annually in an area covering portions of Wisconsin, Iowa, and Minnesota. Most investigations are customer-initiated after a problem is discovered, but Alliant will proactively test if a farmer is significantly expanding a farm operation. Mr. Harvey stated that SV concerns most commonly result from a combination of utility and on-farm contributions, and that his utility's goal is to provide a quality utility system neutral path for current, so that less primary neutral current flows through the farm grounding system to return to its source. He indicated that, although within its service area only



Wisconsin has regulations or standards for utilities to take action related to SV, Alliant has chosen to also apply those standards to its Iowa and Minnesota customers in an effort to give everyone similar service. He characterized the standard or level of concern adopted in Wisconsin as a conservative, preinjury level which facilitates a systematic analysis that can be duplicated and that results in comparable information which can be provided to the utility and customer.

Mr. Harvey additionally described his multiphase investigation process, and said that action will be taken by the utility to improve its system if it is found to contribute one milliamp or one-half volt or more to the animal contact voltage. Phase one of the investigation involves identifying the animal contact monitoring location and then monitoring the voltage overnight or for two milkings. If the voltage is less than 0.5 volts, no further action is taken by the utility. Mr. Harvey noted that this does not always resolve the issue. Some parties continue to pursue claims or litigation. If the voltage is 0.5 volts or higher, a phase two investigation is initiated to determine the sources. This investigation evaluates the load box (determines the utility's contribution to animal contact), the secondary neutral voltage drop (evaluates the condition of secondary neutral system), the signature (identifies equipment faults and problems with farm wiring), the primary profile (assesses the condition of the primary neutral system near the farm), and farm load monitoring (performed over an extended period and during higher load times).

Mr. Harvey stated that customers are given one free investigation per year. Beyond that, higher level investigations must be paid for by the customer. When asked by a committee member about isolators, Mr. Harvey answered that Alliant's policy is to install an isolator if the problem cannot be fixed within five days. The isolator is removed after the problem has been fixed. He estimates that each isolator costs between \$3,000 and \$5,000.

Committee members asked whether farmers ever refuse him access to their farm for testing, and whether he believes his work reduces lawsuits. He answered that he has never had a farmer refuse him access to property, and he is not sure whether the work has reduced litigation, but it is his job to proactively prevent litigation from arising, and he believes his work is cost effective for all parties involved.

## **XII. Dairy Farmer Perspective**

Mr. Paul Wells, a dairy farmer in Bloomfield, Iowa, provided his perspective on SV from the standpoint of a dairy producer. Mr. Wells is also a board member of the Iowa State Dairy Association, as well as the director of the REC in Bloomfield. Mr. Wells stated that SV can cause low milk production, impact milk quality, and contribute to reproduction issues, all of which have financial ramifications for the farmer. Accordingly, he indicated he would be motivated to resolve an SV issue as quickly as possible. Furthermore, the farming process is a highly technical endeavor and as such he would welcome the involvement of experts who could provide assistance. As an example, he stated that his dairy facility has no fewer than 23 individual motors, all of which are susceptible to electrical errors or wiring mistakes. He supports standards as providing a guideline to measure against, and a procedure to follow to achieve resolution. He closed by stating that farmers are accustomed to standards, and that he believes any standards adopted by Iowa should have clear guidelines and procedures, provide notice and right of access to utilities, and establish some minimum level of acceptable SV.



## **Stray Electric Current and Agriculture Study Committee**

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### **XIII. Stray Voltage and Legislative Parameters**

Mr. Dennis Puckett, Sullivan and Ward, P.C., Des Moines, highlighted statements made in previous presentations as supporting the establishment of SV standards. He questioned the feasibility of creating and enforcing a “voluntary” approach, and maintained that litigation can proceed with standards in place. He also questioned the claims that SV was not a significant problem in Iowa. According to his records, five or six of the 19 RECs in Iowa have been involved in SV litigation in the last five years, which he believes is a significant number. Mr. Puckett noted that electric providers have a legal obligation to provide power, notwithstanding the liability issues, and emphasized that SV legislation, rather than promoting liability protection, will assist both disputing parties in achieving an amicable resolution, and that such legislation needs to incorporate the three primary elements of notice, access, and standardized testing.

### **XIV. Committee Discussion**

Co-chairperson Courtney observed that the discussion of whether or not to specify SV standards does not entail a “right” versus “wrong” perspective. The stakeholders were encouraged to continue their dialogue in an effort to achieve a workable consensus solution. The committee adopted a motion by Co-chairperson Cownie that the committee review the committee’s Final Report when it becomes available and submit the report, if approved, to the General Assembly.

### **XV. Materials Filed with the Legislative Services Agency**

The following materials were distributed at or in connection with the meeting and are filed with the Legislative Services Agency. The materials may be accessed from the link on the committee’s Internet site:

<https://www.legis.iowa.gov/Schedules/committeeDocs.aspx?GA=85&CID=930>

1. Stray Voltage: The Research Perspective – Douglas Reinemann, Ph.D., University of Wisconsin-Madison
2. Solution to Minimizing Stray Voltage – Iowa Farm Bureau Federation
3. Comments for the State of Iowa Stray Electric Current and Agriculture Study Committee – Stuart Mondschein, Wheeler, Van Sickle & Anderson, S.C.
4. Letter of Support – Iowa Area Development Group
5. Stray Voltage Testing and Detection – Tony Harvey, Alliant Energy
6. Statement in Support of Iowa’s Rural Electric Cooperatives – Iowa Association of Business and Industry (written testimony)
7. Statement in Support of Iowa’s Rural Electric Cooperatives and Their Legislative Efforts (written testimony)
8. Stray Voltage State Regulatory Comparison Chart (written testimony)
9. Resolution Letter – Iowa Utilities Board (requested at meeting and subsequently submitted)

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